EP 2 340 502 A1

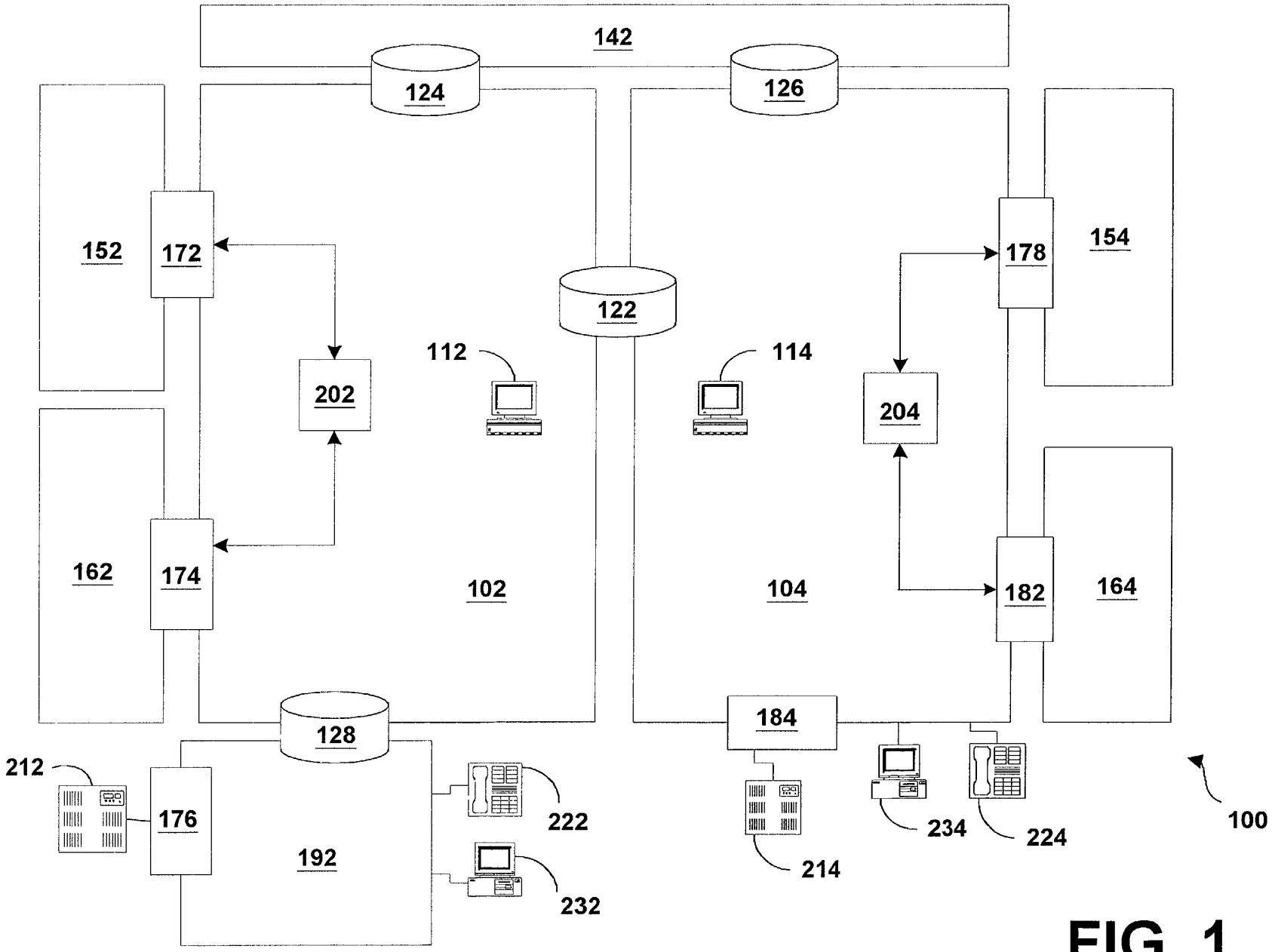

FIG. 1

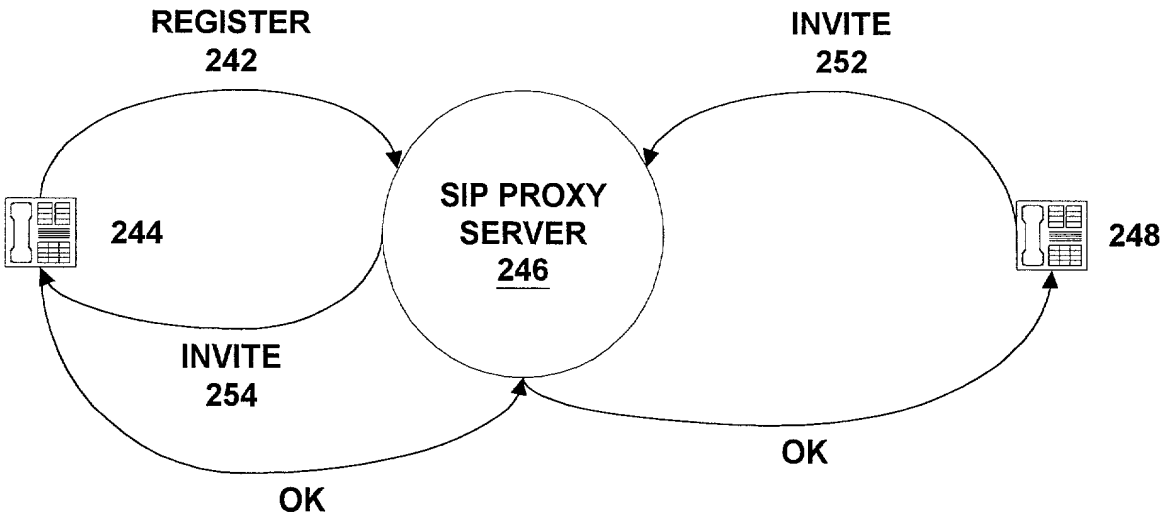

FIG. 2
(PRIOR ART)

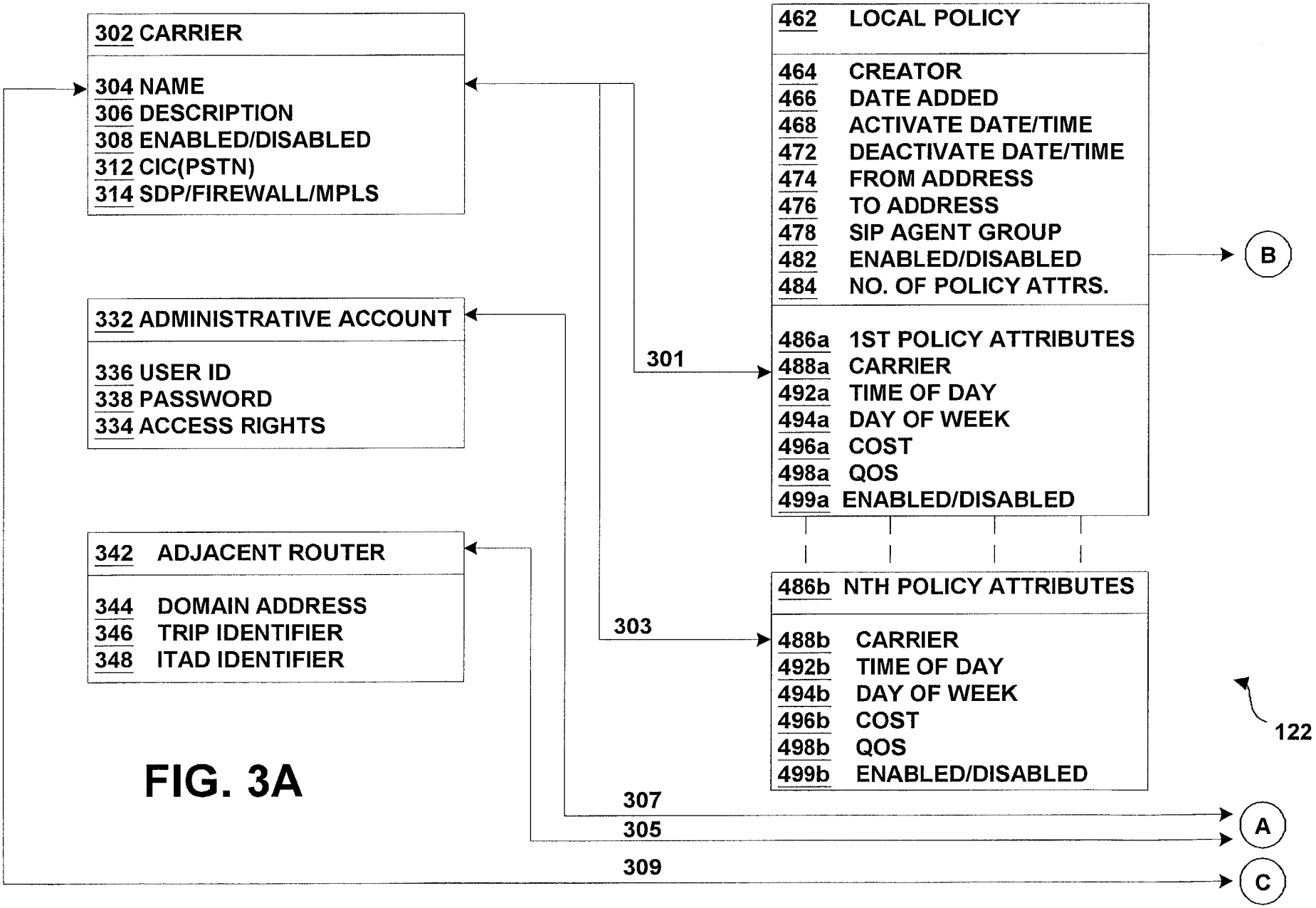
302 CARRIER
304 NAME
306 DESCRIPTION
308 ENABLED/DISABLED
312 CIC(PSTN)
314 SDP/FIREWALL/MPLS
462 LOCAL POLICY
464 CREATOR
466 DATE ADDED
468 ACTIVATE DATE/TIME
472 DEACTIVATE DATE/TIME
474 FROM ADDRESS
476 TO ADDRESS
478 SIP AGENT GROUP
482 ENABLED/DISABLED
484 NO. OF POLICY ATTRS.
B
332 ADMINISTRATIVE ACCOUNT
336 USER ID
338 PASSWORD
334 ACCESS RIGHTS
301
486a 1ST POLICY ATTRIBUTES
488a CARRIER
492a TIME OF DAY
494a DAY OF WEEK
496a COST
498a QOS
499a ENABLED/DISABLED
342 ADJACENT ROUTER
344 DOMAIN ADDRESS
346 TRIP IDENTIFIER
348 ITAD IDENTIFIER
303
486b NTH POLICY ATTRIBUTES
488b CARRIER
492b TIME OF DAY
494b DAY OF WEEK
496b COST
498b QOS
499b ENABLED/DISABLED
122
307
305
309
A
C

FIG. 3A

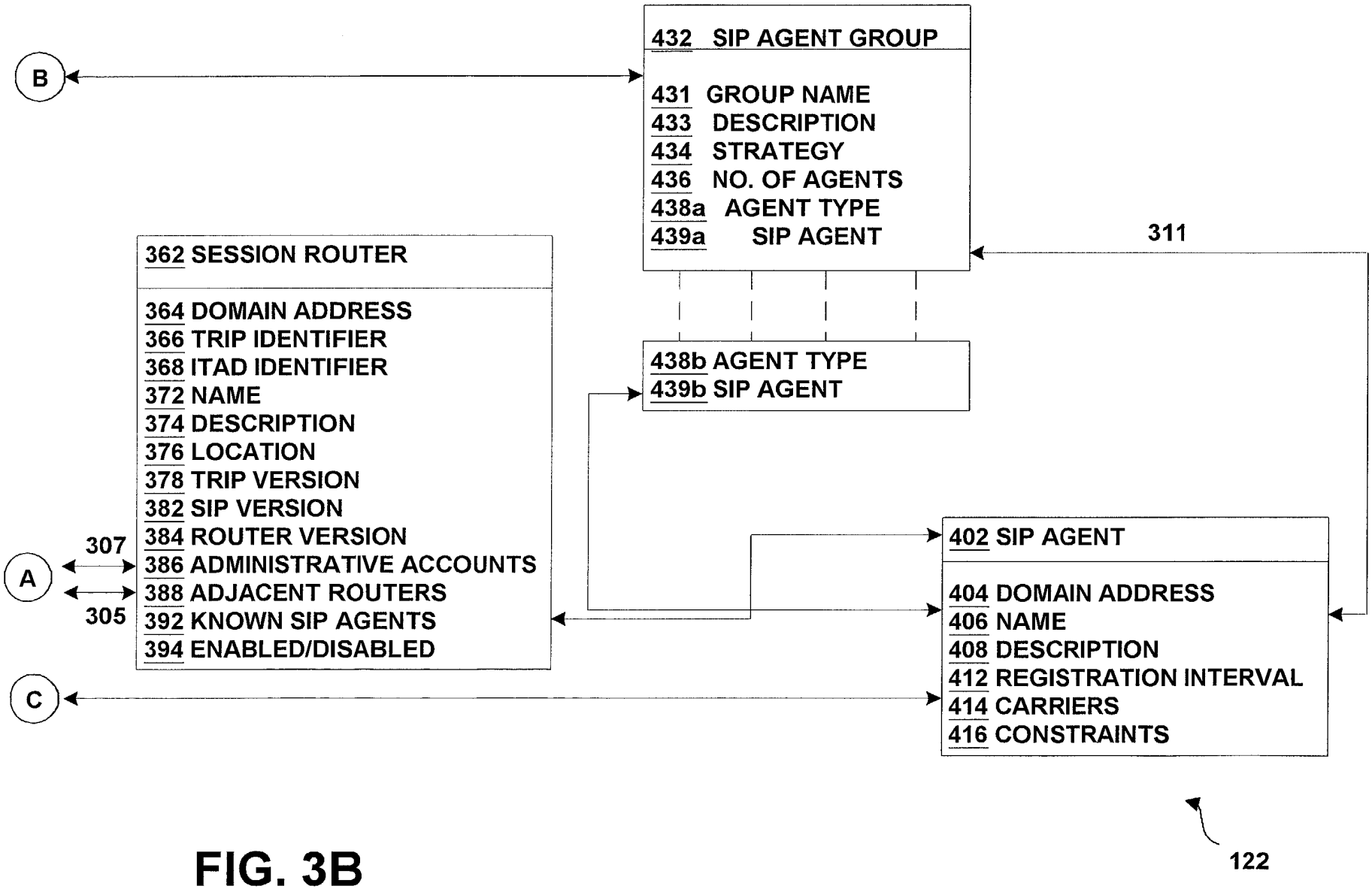
B
432 SIP AGENT GROUP
431 GROUP NAME
433 DESCRIPTION
434 STRATEGY
436 NO. OF AGENTS
438a AGENT TYPE
439a SIP AGENT
311
362 SESSION ROUTER
364 DOMAIN ADDRESS
366 TRIP IDENTIFIER
368 ITAD IDENTIFIER
372 NAME
374 DESCRIPTION
376 LOCATION
378 TRIP VERSION
382 SIP VERSION
384 ROUTER VERSION
386 ADMINISTRATIVE ACCOUNTS
388 ADJACENT ROUTERS
392 KNOWN SIP AGENTS
394 ENABLED/DISABLED
438b AGENT TYPE
439b SIP AGENT
307
A
305
C
402 SIP AGENT
404 DOMAIN ADDRESS
406 NAME
408 DESCRIPTION
412 REGISTRATION INTERVAL
414 CARRIERS
416 CONSTRAINTS
122

FIG. 3B

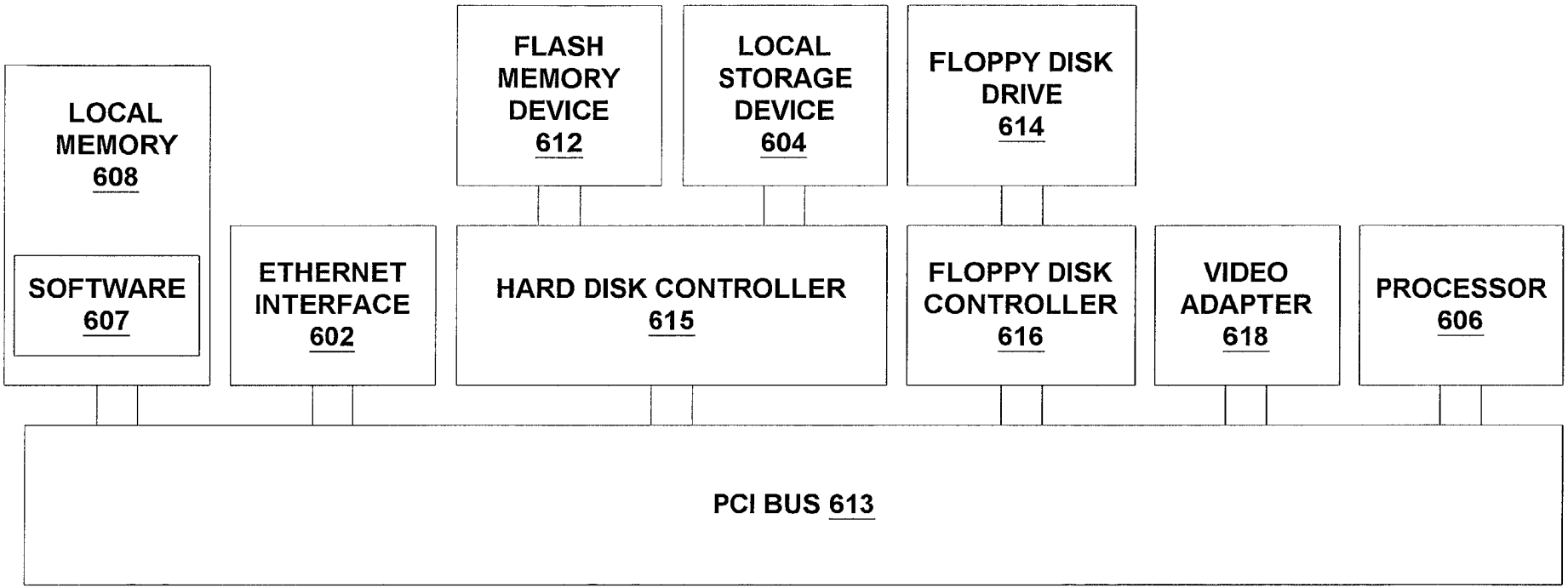
LOCAL MEMORY 608
SOFTWARE 607
FLASH MEMORY DEVICE 612
LOCAL STORAGE DEVICE 604
FLOPPY DISK DRIVE 614
ETHERNET INTERFACE 602
HARD DISK CONTROLLER 615
FLOPPY DISK CONTROLLER 616
VIDEO ADAPTER 618
PROCESSOR 606
PCI BUS 613
122

FIG. 4

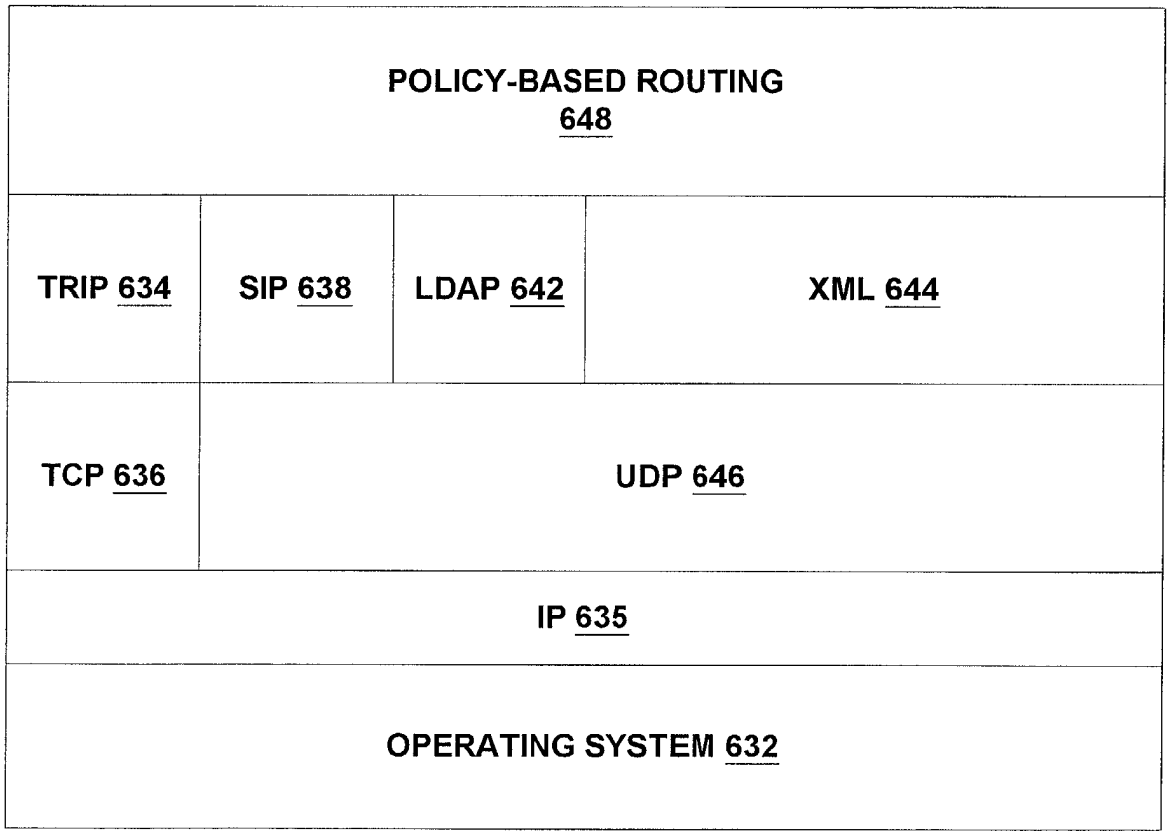
POLICY-BASED ROUTING
648
TRIP 634
SIP 638
LDAP 642
XML 644
TCP 636
UDP 646
IP 635
OPERATING SYSTEM 632
607

FIG. 5

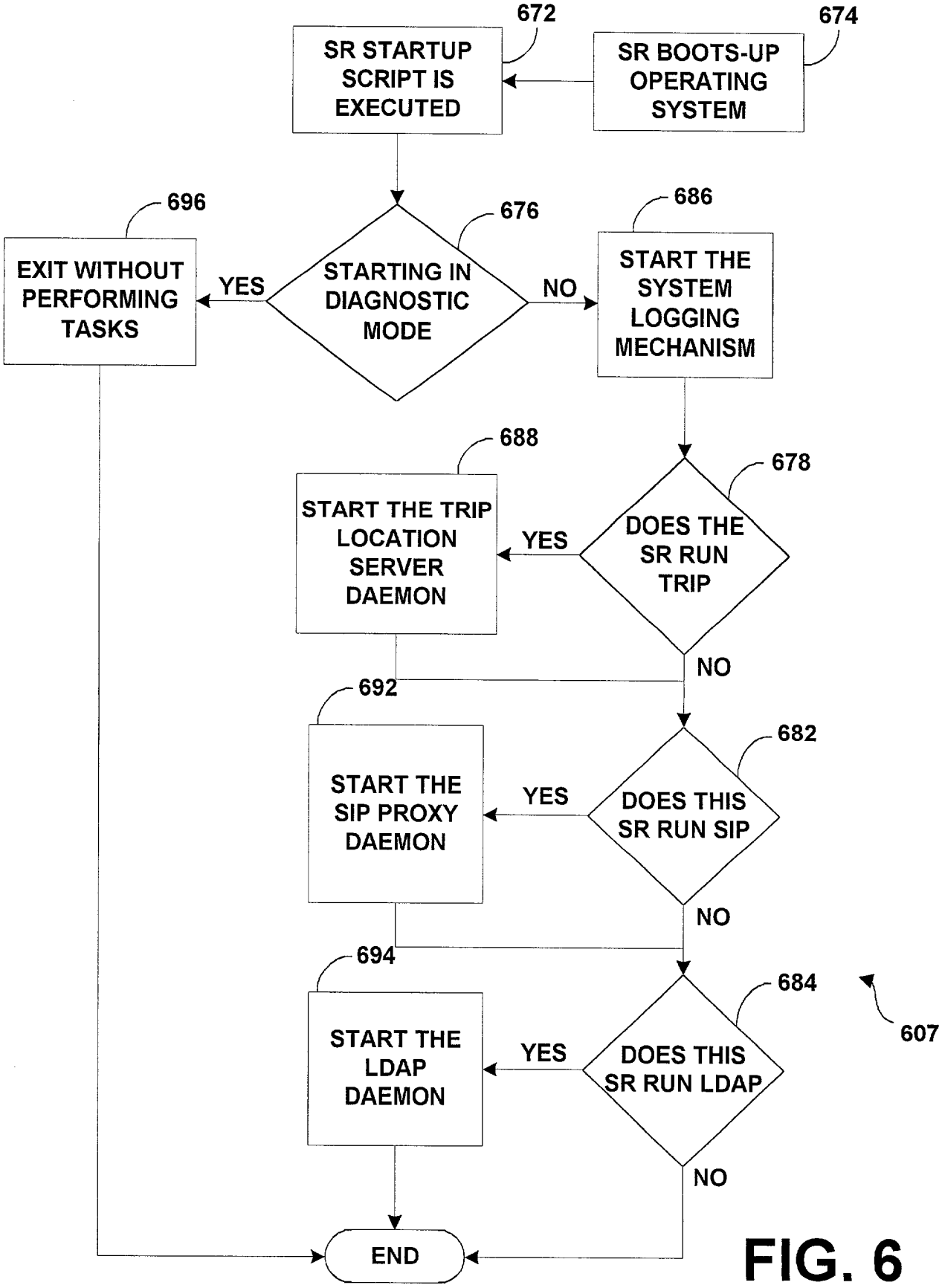
672
SR STARTUP SCRIPT IS EXECUTED
674
SR BOOTS-UP OPERATING SYSTEM
696
EXIT WITHOUT PERFORMING TASKS
676
STARTING IN DIAGNOSTIC MODE
YES
NO
686
START THE SYSTEM LOGGING MECHANISM
688
START THE TRIP LOCATION SERVER DAEMON
678
DOES THE SR RUN TRIP
YES
NO
692
START THE SIP PROXY DAEMON
682
DOES THIS SR RUN SIP
YES
NO
694
START THE LDAP DAEMON
684
DOES THIS SR RUN LDAP
YES
NO
607
END

FIG. 6

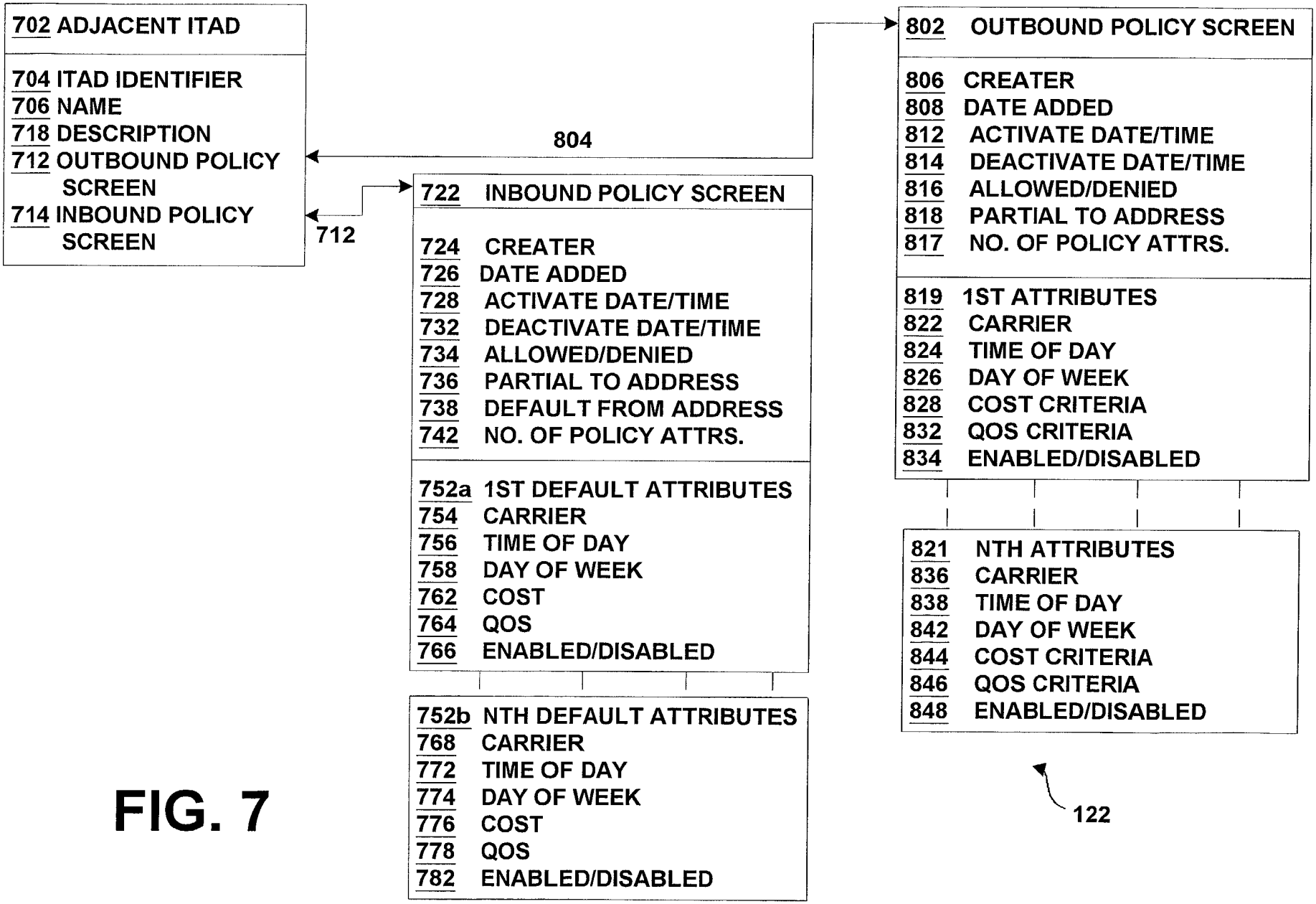
702 ADJACENT ITAD
704 ITAD IDENTIFIER
706 NAME
718 DESCRIPTION
712 OUTBOUND POLICY SCREEN
714 INBOUND POLICY SCREEN
804
712
722 INBOUND POLICY SCREEN
724 CREATER
726 DATE ADDED
728 ACTIVATE DATE/TIME
732 DEACTIVATE DATE/TIME
734 ALLOWED/DENIED
736 PARTIAL TO ADDRESS
738 DEFAULT FROM ADDRESS
742 NO. OF POLICY ATTRS.
752a 1ST DEFAULT ATTRIBUTES
754 CARRIER
756 TIME OF DAY
758 DAY OF WEEK
762 COST
764 QOS
766 ENABLED/DISABLED
752b NTH DEFAULT ATTRIBUTES
768 CARRIER
772 TIME OF DAY
774 DAY OF WEEK
776 COST
778 QOS
782 ENABLED/DISABLED
802 OUTBOUND POLICY SCREEN
806 CREATER
808 DATE ADDED
812 ACTIVATE DATE/TIME
814 DEACTIVATE DATE/TIME
816 ALLOWED/DENIED
818 PARTIAL TO ADDRESS
817 NO. OF POLICY ATTRS.
819 1ST ATTRIBUTES
822 CARRIER
824 TIME OF DAY
826 DAY OF WEEK
828 COST CRITERIA
832 QOS CRITERIA
834 ENABLED/DISABLED
821 NTH ATTRIBUTES
836 CARRIER
838 TIME OF DAY
842 DAY OF WEEK
844 COST CRITERIA
846 QOS CRITERIA
848 ENABLED/DISABLED
122

FIG. 7

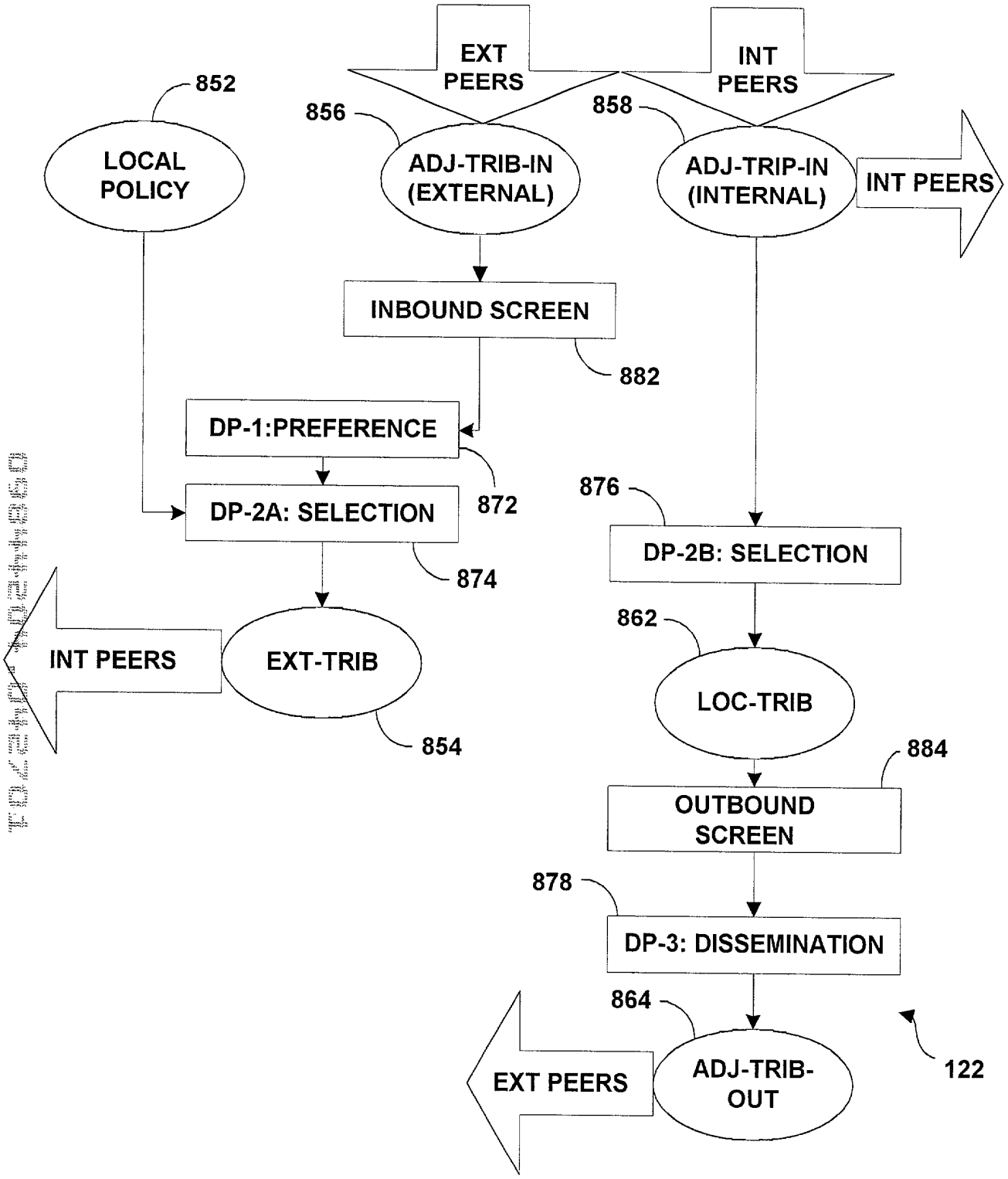
EXT PEERS
INT PEERS
852
LOCAL POLICY
856
ADJ-TRIB-IN (EXTERNAL)
858
ADJ-TRIP-IN (INTERNAL)
INT PEERS
INBOUND SCREEN
882
DP-1:PREFERENCE
872
DP-2A: SELECTION
874
876
DP-2B: SELECTION
862
LOC-TRIB
884
OUTBOUND SCREEN
878
DP-3: DISSEMINATION
INT PEERS
EXT-TRIB
854
864
EXT PEERS
ADJ-TRIB-OUT
122

FIG. 8

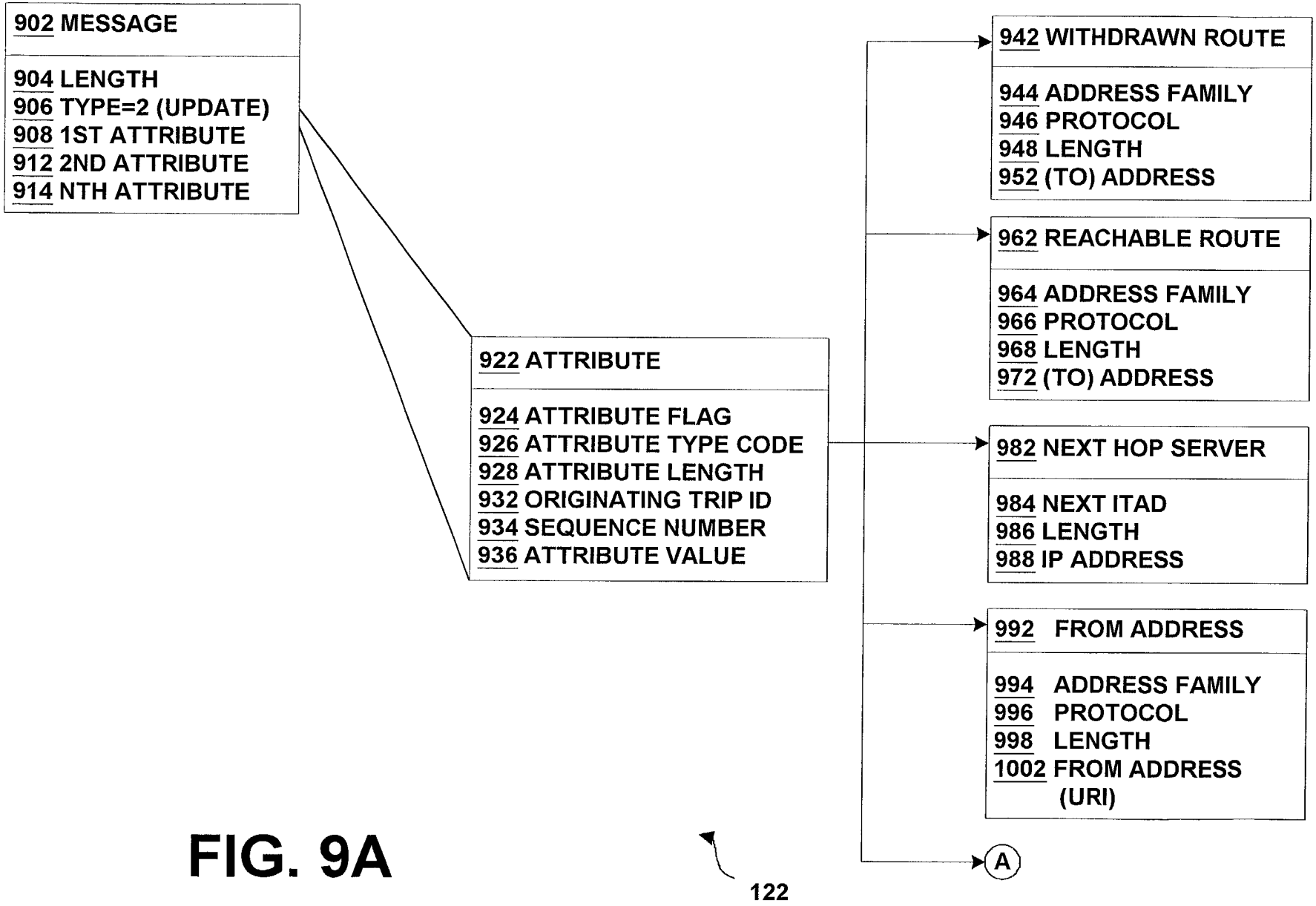
902 MESSAGE
904 LENGTH
906 TYPE=2 (UPDATE)
908 1ST ATTRIBUTE
912 2ND ATTRIBUTE
914 NTH ATTRIBUTE
922 ATTRIBUTE
924 ATTRIBUTE FLAG
926 ATTRIBUTE TYPE CODE
928 ATTRIBUTE LENGTH
932 ORIGINATING TRIP ID
934 SEQUENCE NUMBER
936 ATTRIBUTE VALUE
942 WITHDRAWN ROUTE
944 ADDRESS FAMILY
946 PROTOCOL
948 LENGTH
952 (TO) ADDRESS
962 REACHABLE ROUTE
964 ADDRESS FAMILY
966 PROTOCOL
968 LENGTH
972 (TO) ADDRESS
982 NEXT HOP SERVER
984 NEXT ITAD
986 LENGTH
988 IP ADDRESS
992 FROM ADDRESS
994 ADDRESS FAMILY
996 PROTOCOL
998 LENGTH
1002 FROM ADDRESS (URI)
A
122

FIG. 9A

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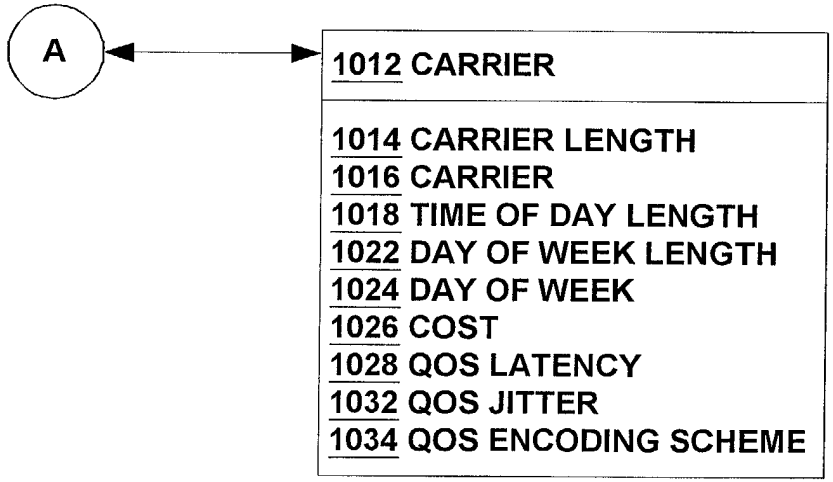

FIG. 9B

US 2002/0184360 A1

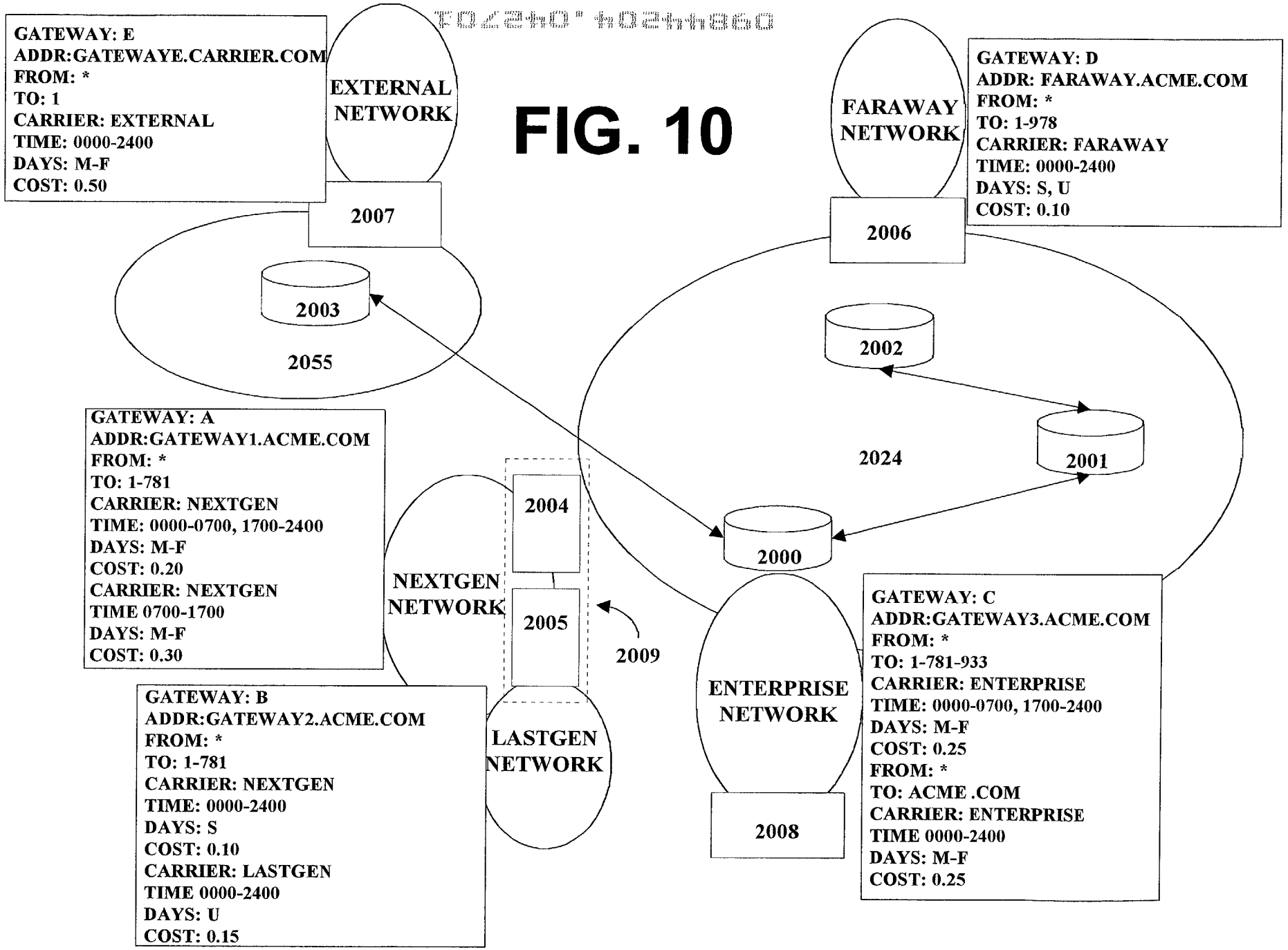

FIG. 10

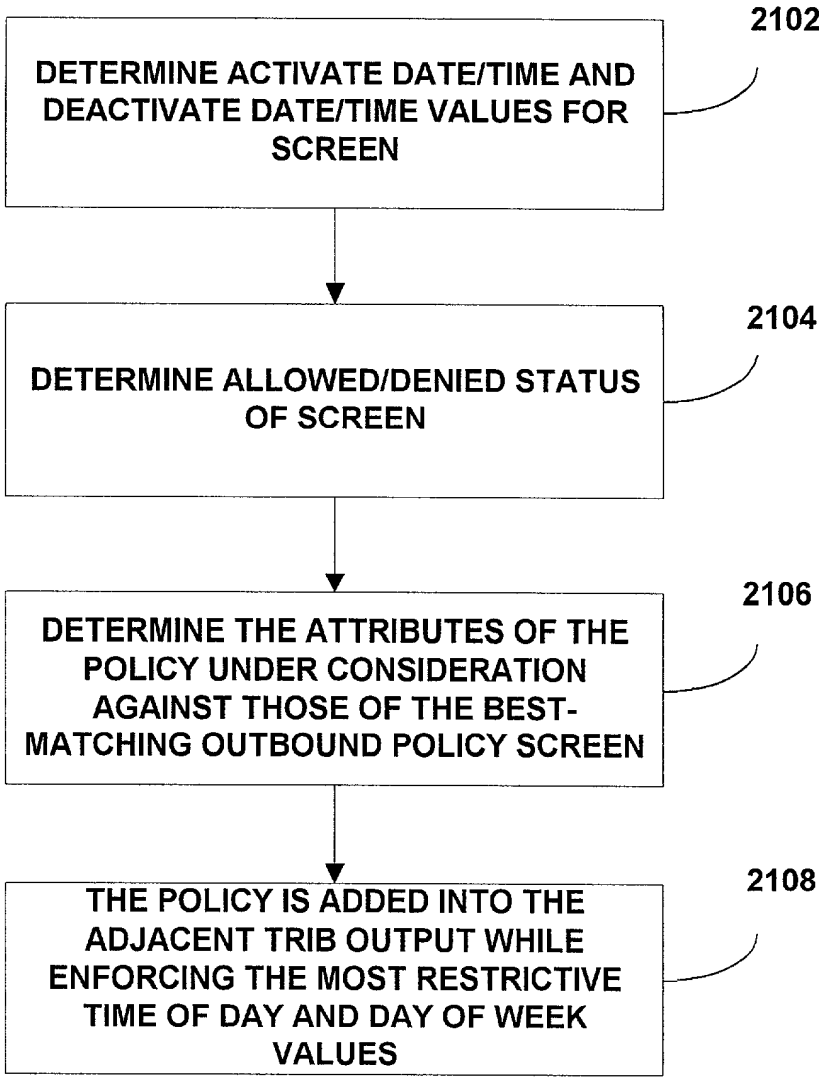
2102
DETERMINE ACTIVATE DATE/TIME AND DEACTIVATE DATE/TIME VALUES FOR SCREEN
2104
DETERMINE ALLOWED/DENIED STATUS OF SCREEN
2106
DETERMINE THE ATTRIBUTES OF THE POLICY UNDER CONSIDERATION AGAINST THOSE OF THE BEST-MATCHING OUTBOUND POLICY SCREEN
2108
THE POLICY IS ADDED INTO THE ADJACENT TRIB OUTPUT WHILE ENFORCING THE MOST RESTRICTIVE TIME OF DAY AND DAY OF WEEK VALUES
122

FIG. 11

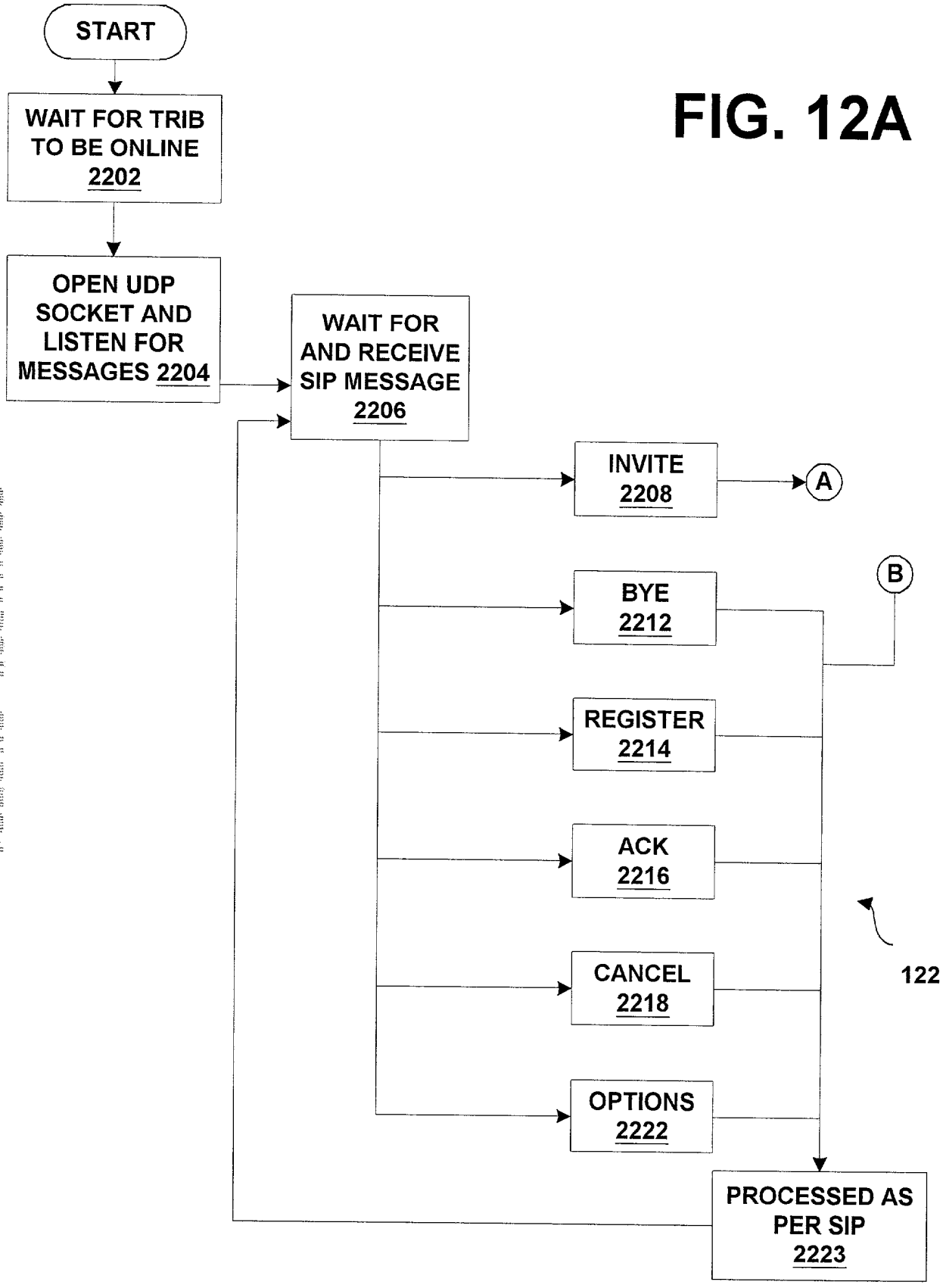
START
WAIT FOR TRIB TO BE ONLINE 2202
OPEN UDP SOCKET AND LISTEN FOR MESSAGES 2204
WAIT FOR AND RECEIVE SIP MESSAGE 2206
INVITE 2208
A
BYE 2212
B
REGISTER 2214
ACK 2216
CANCEL 2218
OPTIONS 2222
PROCESSED AS PER SIP 2223
122

FIG. 12A

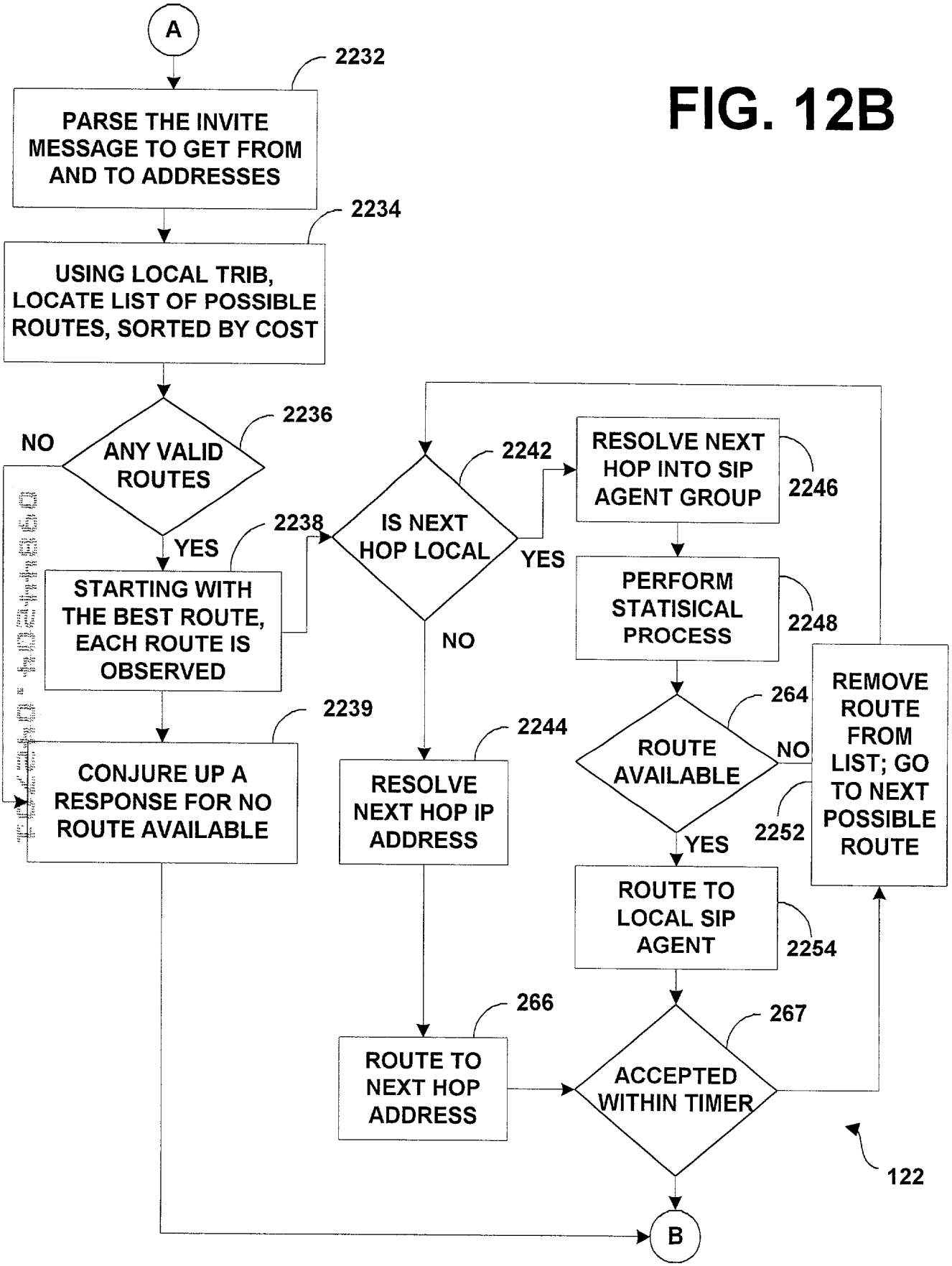
A
2232
PARSE THE INVITE MESSAGE TO GET FROM AND TO ADDRESSES
2234
USING LOCAL TRIB, LOCATE LIST OF POSSIBLE ROUTES, SORTED BY COST
2236
ANY VALID ROUTES
NO
YES
2238
STARTING WITH THE BEST ROUTE, EACH ROUTE IS OBSERVED
2239
CONJURE UP A RESPONSE FOR NO ROUTE AVAILABLE
2242
IS NEXT HOP LOCAL
YES
NO
2244
RESOLVE NEXT HOP IP ADDRESS
266
ROUTE TO NEXT HOP ADDRESS
RESOLVE NEXT HOP INTO SIP AGENT GROUP
2246
PERFORM STATISICAL PROCESS
2248
264
ROUTE AVAILABLE
NO
YES
2252
REMOVE ROUTE FROM LIST; GO TO NEXT POSSIBLE ROUTE
ROUTE TO LOCAL SIP AGENT
2254
267
ACCEPTED WITHIN TIMER
122
B

FIG. 12B

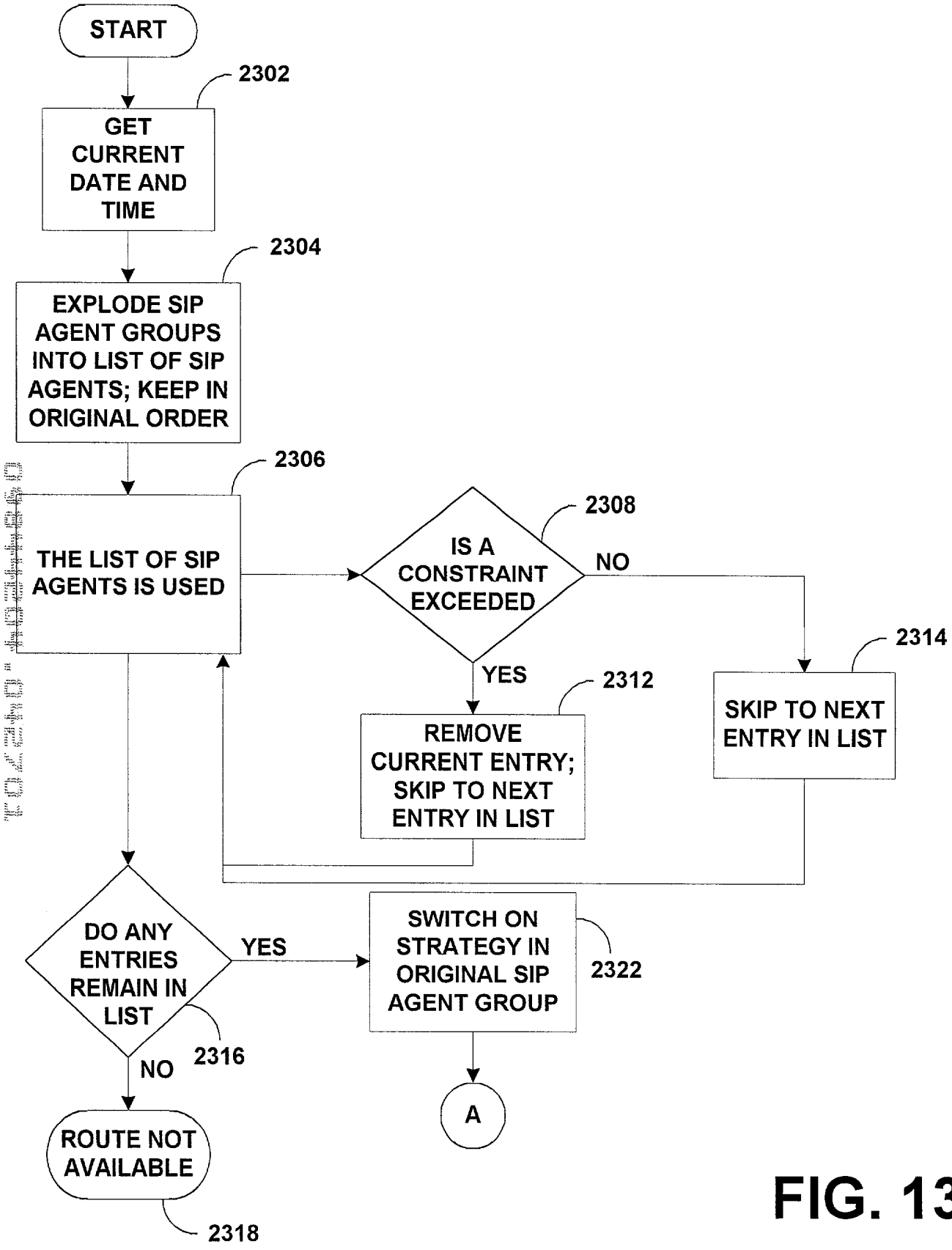
START
2302
GET CURRENT DATE AND TIME
2304
EXPLODE SIP AGENT GROUPS INTO LIST OF SIP AGENTS; KEEP IN ORIGINAL ORDER
2306
THE LIST OF SIP AGENTS IS USED
2308
IS A CONSTRAINT EXCEEDED
NO
YES
2312
REMOVE CURRENT ENTRY; SKIP TO NEXT ENTRY IN LIST
2314
SKIP TO NEXT ENTRY IN LIST
DO ANY ENTRIES REMAIN IN LIST
YES
SWITCH ON STRATEGY IN ORIGINAL SIP AGENT GROUP
2322
2316
NO
A
ROUTE NOT AVAILABLE
2318

FIG. 13A

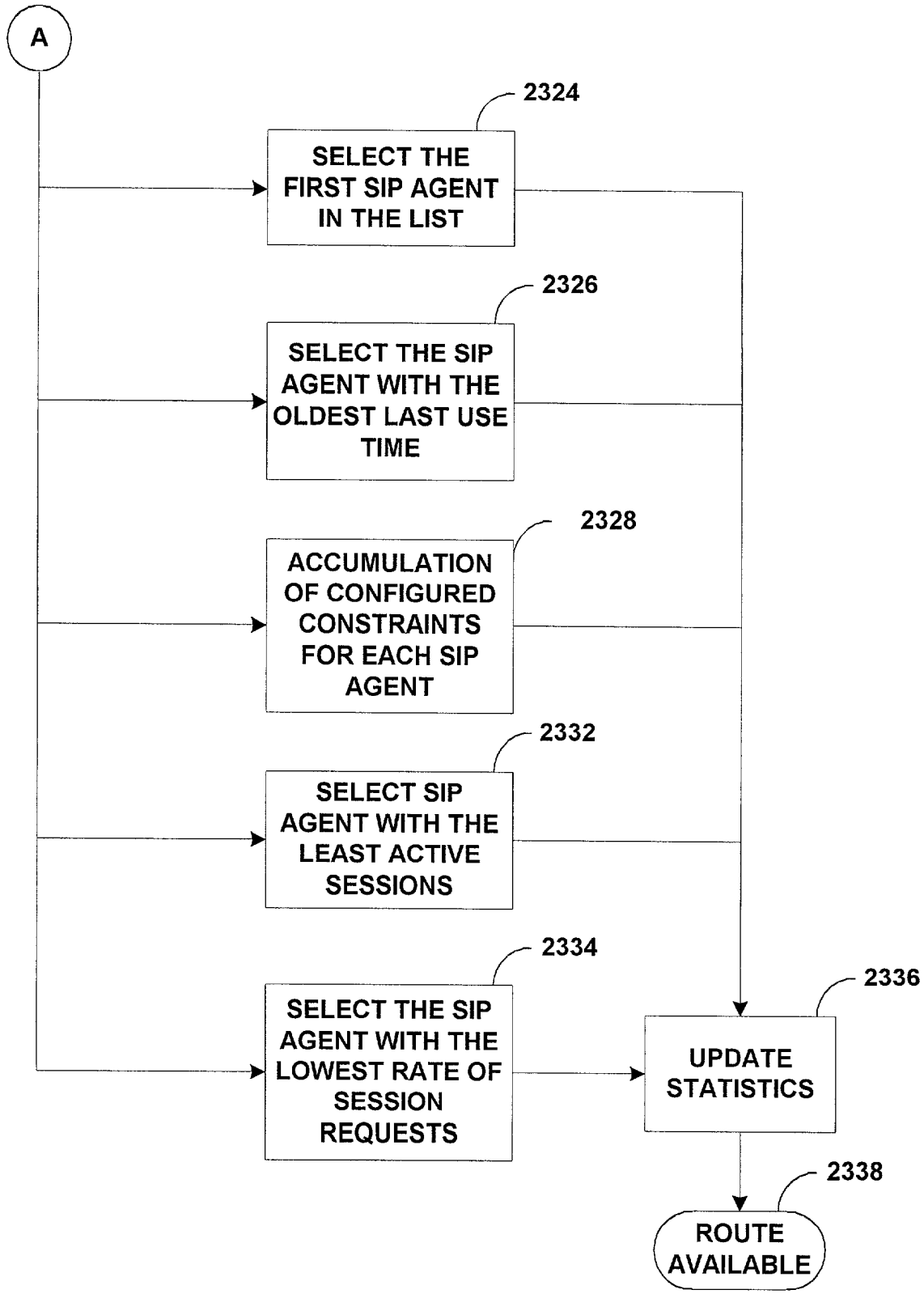
A
2324
SELECT THE FIRST SIP AGENT IN THE LIST
2326
SELECT THE SIP AGENT WITH THE OLDEST LAST USE TIME
2328
ACCUMULATION OF CONFIGURED CONSTRAINTS FOR EACH SIP AGENT
2332
SELECT SIP AGENT WITH THE LEAST ACTIVE SESSIONS
2334
SELECT THE SIP AGENT WITH THE LOWEST RATE OF SESSION REQUESTS
2336
UPDATE STATISTICS
2338
ROUTE AVAILABLE

FIG. 13B

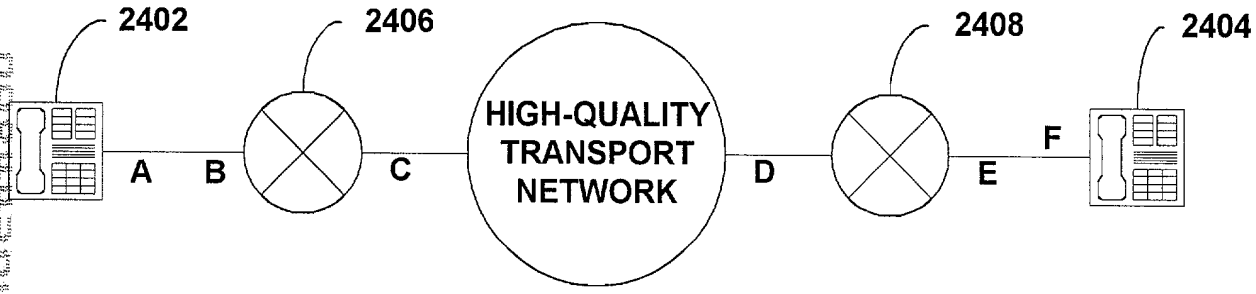

FIG. 14

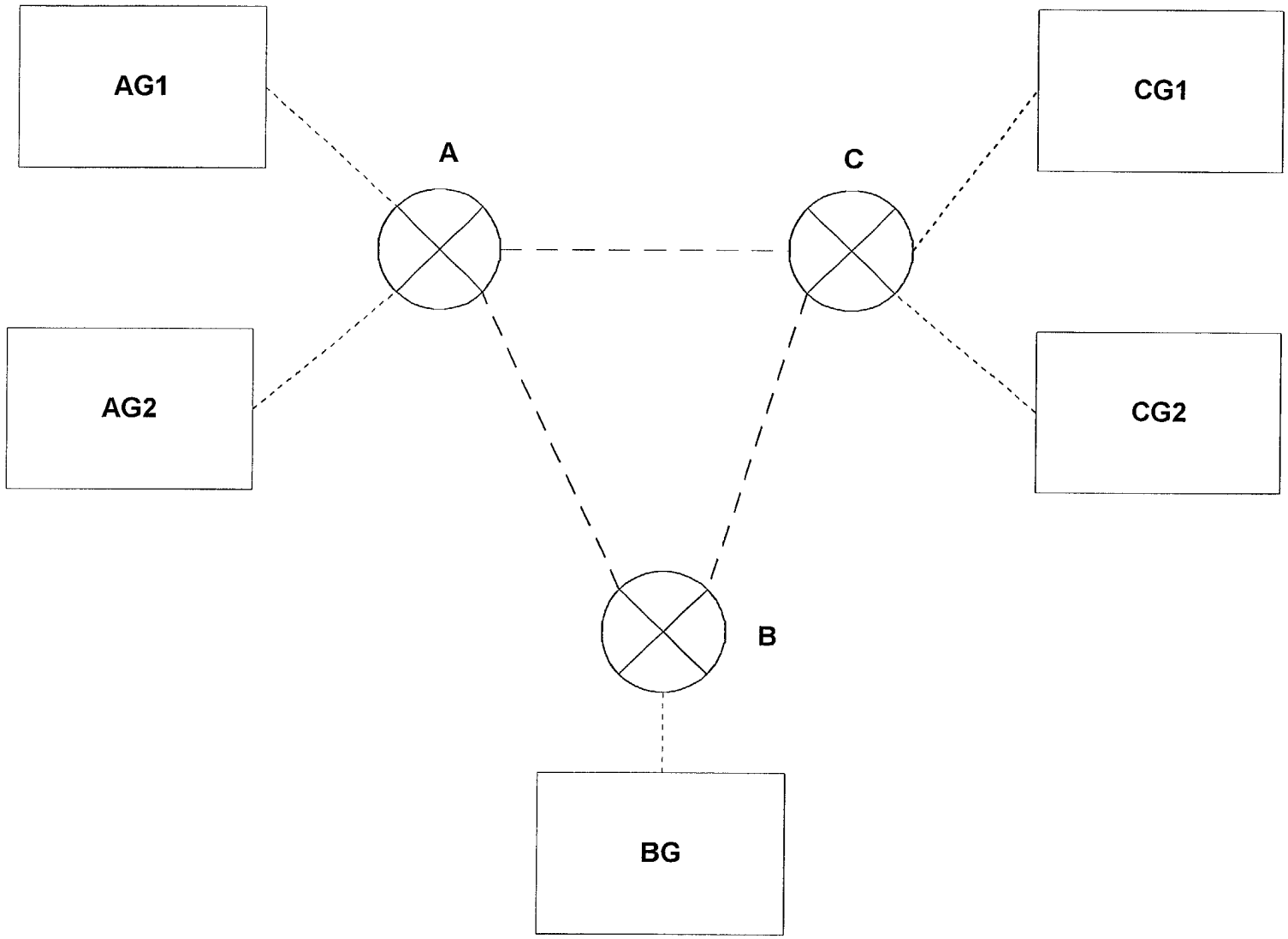

FIG. 15

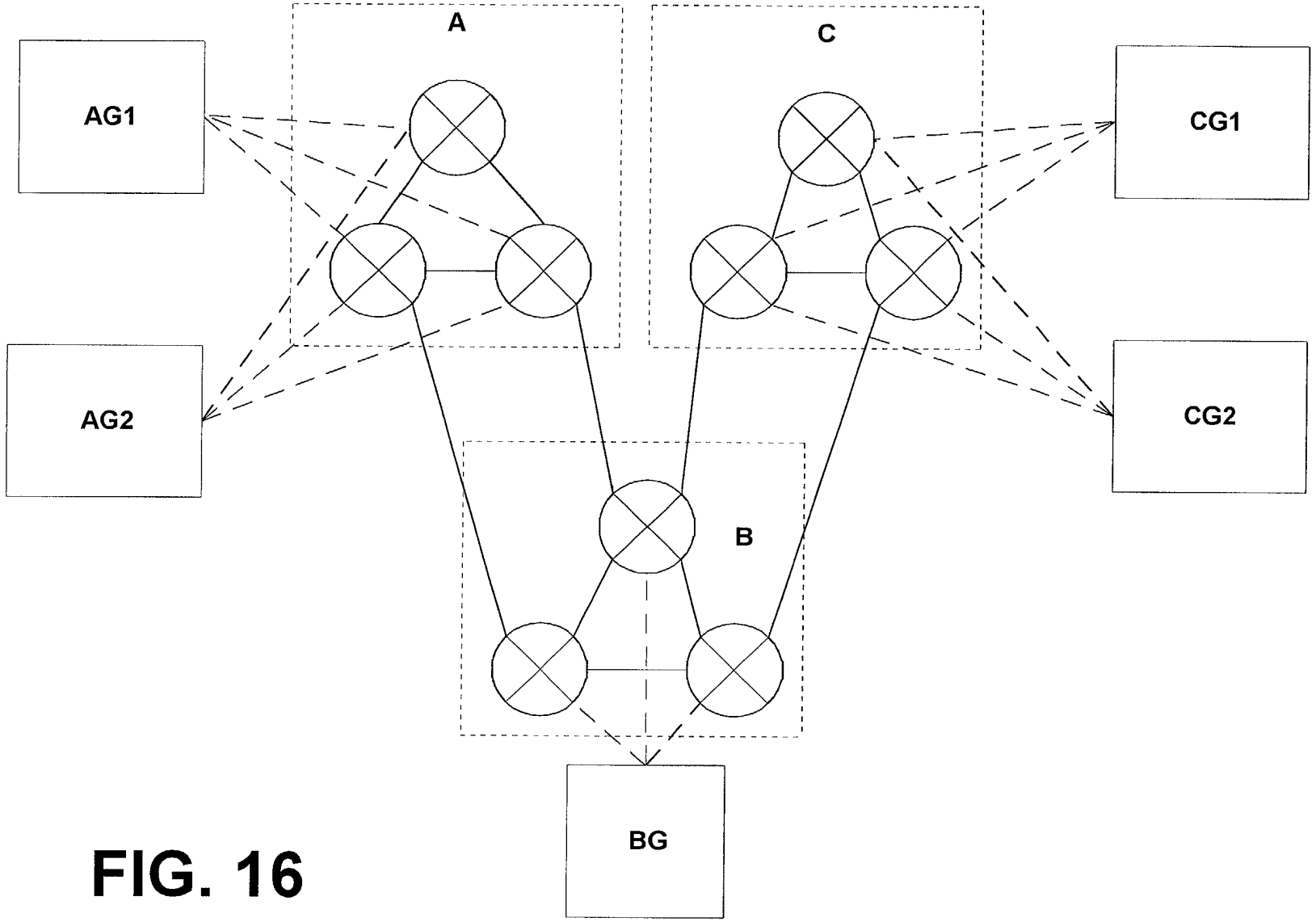

FIG. 16